sheaths; lower rather broad, leafy, often overtopping the spikes; second long, setaceous; the rest small, short. Spikes lax below, scarcely an inch long. Glumes oblong, blunt, purplish brown with a broad green band up the midrib, at least one-third shorter than the fruit; on the barren spike paler and obovate-lanceolate. Perigone nearly twice as long as the nut, gradually narrowing from below the middle to the top, pale green, with numerous and rather strongly marked ribs, which do not extend to the apex; beak very short, truncate, entire. Nut compressed, rather longer than broad, widening upwards, rounded above, with a short somewhat conical beak, from which the style is deciduous, pale brown, opake.

Found at Wood Hey near Hebden Bridge, Yorkshire, in 1840, by Mr. S. Gibson of that place: flowering in June.

In *C. Goodenovii* (C. cæspitosa, *Gooden., Sm.*) the fruit is elliptical and very slightly longer than the glumes, the nut roundish and rather broader than long, the glumes purple with a slender pale green keel.

In *C. cæspitosa* (C. stricta, *Gooden., Sm.*) the fruit is elliptic-oblong, and the same length as the glumes.

EXPLANATION OF PLATE V.

a. Glume of the female spikes.
b. Fruit, pericarp including the nut. *c.* Nut.

XXVIII.—*Contributions to the Ichthyology of Australia.* By John Richardson, M.D., F.R.S., &c., Inspector of Hospitals, Haslar.

[Continued from p. 28.]

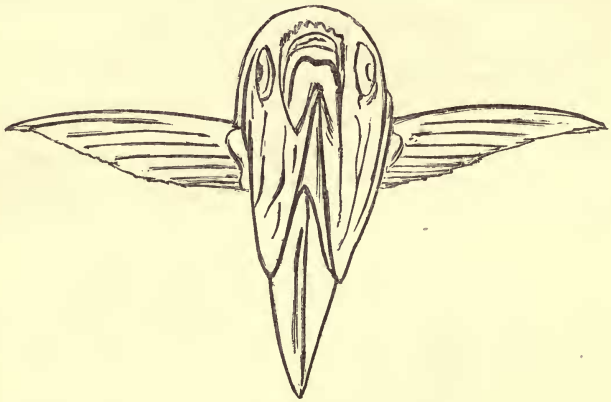
Seriola cultrata, Knife-edge Seriole.

Sciæna cultrata, G. Forster, No. 212; J. R. Forster, MS. iv. 9, apud Schn.
Cichla cultrata, Bl. Schn., p. 343.
Scomber clupeoides, Shaw, Brit. Mus. [The *Sc. clupeoides* of Broussonnet is a *Cybium*, C. & V. viii. p. 178.]

This fish was taken with a hook off Norfolk Island on Cook's second voyage. It differs from the other *Seriolæ* described in the 'Histoire des Poissons' in the extremely acute under surface of the head, in the first dorsal being continuous with the second, though lower, and in other particulars. We must refer to Schneider for J. R. Forster's account of it, but it is to be regretted that he does not state whether the vomer and palate-bones are toothed or not. The following particulars are drawn from an inspection of George Forster's figure.

The pectoral fins are small and somewhat falcate. The ventrals are also small, and are attached by their internal borders to the belly,

at the fore-part of a groove, which runs backwards to the anus. The first dorsal is low, nearly even, and contains eight spines, which are united to each other and to the second dorsal by a notched membrane that reaches above their middles. The drawing also indicates a short spine at the base of the first ray of the second dorsal, though only eight spines in all are enumerated by Forster. The fore-part of the soft fin is the highest, and forms a rounded peak, rising abruptly one-fourth above the succeeding rays, which become gradually and evenly shorter. The last ray is not elongated. The anal spines are stronger, and nearly as long as the dorsal ones, and are in like manner connected by a notched membrane to the soft part of the fin. This is similar in form to the opposing dorsal, excepting that it wants the projecting peak at its beginning. Both it and the second dorsal stand in a furrow formed by a low fillet of integument on each side. The caudal is deeply forked. The following is Forster's enumeration of the rays:—Br. 6; D. 8|24; A. 3|26; C. 22; V. 5; P. 15. In the figure 26 rays are marked in the soft dorsal. The lateral line is moderately curved over the pectoral. The length of the specimen was $8\frac{1}{2}$ inches, and the figure is of the natural size. The following front view will give some notion of the wedge-shaped form of the head.



CAPROS AUSTRALIS (*Nob.*), Australian Boar-fish.

In Polack's account of New Zealand, John Dories are enumerated among the fish which frequent the coasts of that promising colony, and there is much probability of his having correctly applied the name, since we find that Dories closely resembling the common species, if not actually the same, exist in the seas of Japan and the Cape of Good Hope, in nearly similar latitudes. Among the drawings which Dr. Lhotsky caused to be made of the fish of Port Arthur in Van Diemen's Land, there is a well-executed figure of a fish

which appears to possess external characters intermediate between those of *Zeus* and *Capros*, but which, from the absence of spiniferous shields at the bases of the dorsal and anal, and on the ventral line, must necessarily be placed in the latter genus. Hitherto only one species of *Capros* has been described; it is an inhabitant of the Mediterranean Sea; but one example of it has been taken on the coast of Cornwall. The Australian species does not seem to have been seen by any of the naturalists of the English or French scientific expeditions, probably because it inhabits great depths, like its Mediterranean congener, and is brought to the surface only by storms.

The body, excluding the trunk of the tail and much of the head, is a regular short oval, whose vertical axis, lying between the first dorsal and anus, is equal to rather more than two-thirds of the longitudinal one. The trunk of the tail is longer and more slender than that of either *Zeus faber* or *Capros aper*.

In the general shape and details of its head the resemblance is greater to the common dory than to the boar-fish, though the snout is more protractile than in the latter. The figure represents the jaws thrust out and extended, and, from the transparency of the integument, the forms of the bony parts are well shown. Their close correspondence with the same parts in *Zeus faber* gives confidence in the general correctness of the artist, though he has doubtless omitted some of the minute details which were not likely to attract the notice of any one except an ichthyologist. The under jaw does not project beyond the upper one when the mouth is open; the maxillary is wider below and more broadly and obliquely truncated than in the dory. The scaly cheek has the high subrhomboidal form of that fish, and the narrow smooth preoperculum makes an angle nearly as obtuse and approaching to a curve: near its anterior end a rounded shoulder is shown, looking backwards. The interoperculum, as large and as long as in the dory, is slightly curved on the edge like an italic *S*. The eye, smaller than that of the European boar-fish, though a little larger than that of the dory, is surmounted by a superciliary crest and cranial ridges, exactly as in the latter, but the little spine on each side of the occiput does not appear in the figure. The gill-flap is rounded; none of the opercular pieces are streaked or furrowed, nor are any spines shown either on the scapular or humeral bones. There are three small scaly patches behind the eye, on the site of the supra-scapular plates.

Rays:—Br. 6?; D. 7|—18; A. 2|—17; C. 13; V. 1|5.

The pectorals are small and rounded. The ventrals are also rounded, and attached farther back than the pectorals, as in *Capros*: a groove is shown in the belly of the fish, reaching to the anus, for their reception when folded back: the spine is very little shorter than the soft rays, and is not represented as rough. The separation of the two dorsals is as complete as in the common dory. The first dorsal is farther back, and occupies less space than in either the dory or

common boar-fish. It stands over the anus and is very tall, though, as it has been curtailed of its proportions in the figure, owing to the smallness of the paper, its exact height cannot be stated. The first ray is the longest, and the others decrease in succession to the last, which is short: none of them are represented with filamentous tips. The membrane ends at the base of the very short ray which begins the second dorsal. The rays of the second fin increase gradually but slightly as they become more posterior. There appear to be two anals, as in the dory, of which the first is very small, consisting of only two spines: the second spine is only half the length of the first, and no membrane is shown connecting it with the second fin, which resembles the soft dorsal in form. In drawing the simple tapering dorsal or anal rays of a dory the articulations are very likely to be overlooked, as is the case in the figure we are commenting upon. The caudal fin is very slightly rounded, as in the dory.

The scales are represented as considerably smaller than in the common boar-fish. The lateral line is more boldly curved, and approaches nearer the dorsal line anteriorly; posteriorly it descends very gradually to assume a straight course through the tail.

The general colour is a pale straw-yellow, with much metallic lustre, without spots. The fins are pale carmine, and there is a carmine blush on the fore-part of the back, with deeper tints of the same on the tips of the scales, top of the head, scapulars, and some parts of the muzzle. The gill-membrane is deep lake-red, and there are some purplish tints on the gill-flap and humeral bones.

The figure is said to be of the natural size, and measures

Dimensions.

	inches.	lines.
From the lips, with the jaws protracted, to the end of caudal..	10	6
——————————————— base of ditto...	9	3
Length of trunk of tail	1	3
Height of ditto	0	7½
——— body	4	6
Length of head, jaws protruded	3	9
Diameter of orbit	0	8
From lips to edge of orbit.....	2	3

Amphacanthus notostictus (*Nob.*), The Loorooga.

No. 17. Mr. Gilbert's list.

This *Amphacanthus* is named "Loorooga" by the natives of the country round Port Essington, and is said by Mr. Gilbert to be common to all the shallow parts of the harbour. In general form it resembles *marmoratus*, and still more nearly *guttatus*, but it is unlike the latter and some of the spotted species allied to it in the form of the profile of the forehead, which is not concave above the orbit, but evenly convex. From *dorsalis*, which exhibits a similar disposition of spots, it differs in the spots being black instead of whitish.

The profile, excluding the fins and a small part of the tail, is a regular oval, whose vertical axis rather exceeds half the longitudinal

one, and is equal to one-third of the total length of the fish. The regular curve of the forehead corresponds with the part of the back on which the soft dorsal is set. There is no gibbosity either before or behind the eye, and the space between the eyes is convex transversely as well as longitudinally, its breadth being increased by the projection of the edge of the orbit at its anterior angle. The convex scaroid intermaxillary projects a little from the general curve of the head.

The length of the head is rather more than one-fifth of the total length, or exactly one-fourth when the caudal is excluded. There are about fifteen teeth in each intermaxillary, and one more in each limb of the lower jaw. The upper teeth are notched at the tip, one point being larger, lanceolate and denticulated; the other point, shorter and standing at the shoulder of the other, is concealed by the integument when *in situ*. The lower teeth are also notched, but the points are scarcely so acute, and the larger one does not exceed the other so much. They are also irregularly denticulated. There are two frontal ridges, which are visible in the dried specimen, together with a faint indication of a mesial one, which must be quite imperceptible in a recent fish. The hind head is marked, over the posterior angle of the eye, with short winding lines, forming a sort of rustic-work, and there are also some ridges and pits on the preorbitar and two following bones of the chain. The projecting anterior edge of the orbit shows faint crenatures under a lens. The posterior half of the cheek is minutely scaly. The limbs of the preoperculum meet at an acute angle, and the upper limb is nearly twice the length of the lower one; the corner is scarcely rounded, and lies under the anterior quarter of the orbit. The surface of the bone is marked by irregular branching streaks and ridges, as is likewise the operculum down to its lower third, which, with the interoperculum and suboperculum, is smooth. The bones of the humeral chain are finely and deeply striated. The gill-opening extends forwards beyond the angle of the preoperculum.

Rays:—D. 13|10; A. 7|9; C. $17\frac{4}{5}$; P. 15; V. 2|3.

The pectoral has an oblique edge and rounded tip, and measures about one-fifth of the total length. The dorsal contains thirteen spines exclusive of the anterior couchant one. The first spine, as in the other species, touches the base of the second one, and is upwards of one-third shorter than the rest, which differ little from each other in height, the eighth, however, being the tallest, and the others decreasing very gradually each way. The spines are transversely compressed, with lateral sharp edges and acute tapering points. They lie alternately to the right and left when recumbent, and the membrane is attached to the alternate edges. Each of them is deeply impressed by two, or even three, longitudinal furrows. The articulated portion of the fin is rounded, its middle rays being highest and overtopping the spines. The anal is similarly formed. The caudal fin when fully spread is lunate on the margin, the depth of the arc being about one-third of the length of the central rays. The height of the trunk of the tail is one-fifth of that of the body. The

lateral line curves like the back, but nears it slightly in its progress, and changes suddenly to a straight course through the tail. It is formed by a series of simple linear elevations which become continuous towards the tail; two or three next the shoulder emit oblique folds upwards. All the scales are small and firmly imbedded in the integument.

The colours of the specimen are faded, but blackish dots are distinctly seen on the sides. They coalesce into short curved lines on the back, become smaller as they descend beyond the lateral line, and disappear altogether above the level of the pectorals. There are vestiges of dark shades on the spinous parts of the dorsal and anal; the rest of the fins appear to have been pale and spotless. A pale band, of a pearly hue in the dried specimen, runs obliquely forwards and downwards from behind the eye, and includes the gill-cover, preoperculum, and the scaly half of the cheek. Two or three short bars run back from the preorbitar over the scaly part of the cheek.

Dimensions.	inches.	lines.
Length from upper lip to extremity of upper caudal lobe	8	2
——— ——— ——— under ditto	7	11
——— ——— ——— base of caudal	6	8
——— ——— ——— beginning of anal	3	10
——— ——— ——— anus	2	11
——— ——— ——— ventrals	2	4
——— ——— ——— dorsal	2	2
——— ——— ——— upper angle of gill-opening	1	8
——— ——— ——— centre of eye	1	1
Long diameter of orbit	0	6
Vertical ditto	0	4
Height of body before anal	2	10
——— trunk of tail	0	7
Length of ditto	0	5
——— dorsal fin	4	8
——— spinous part of ditto	3	6
——— soft part of ditto	1	3
Height of eighth dorsal spine	0	11
——— second ditto	0	9
——— thirteenth	0	9½
——— middle rays of soft dorsal	1	0
——— third anal spine	0	11½
——— seventh ditto	0	10¾
——— middle soft rays of ditto	1	0
Length of pectorals	1	6
——— exterior ventral spine	1	1
——— interior ditto	0	10
——— caudal lobes	1	8
——— central caudal rays	1	0
Depth of caudal notch	0	4

Amphacanthus gymnopareius (*Nob.*), Naked-faced Amphacanthus.

No. 14. Mr. Gilbert's list.

This species, the 'Nurdoot' of the aborigines of Port Es-

sington, inhabits the quiet secluded bays of the harbour, where the water is shallow and the bottom soft and sandy.

It is a more elongated species than the preceding one, has a more slender tail, and possesses on the whole a neater form, its profile being very similar to that of *Harpurus inermis* of Forster, of which a drawing exists in the Banksian library*. The vertical height of the body is contained thrice and one-third in the total length. The vertical fins are lower than in the preceding, the spines are not so strong nor so acutely furrowed, and the soft parts of the anal and dorsal are less rounded, being rather highest anteriorly. The caudal is forked to the depth of one-third of its length; the pectorals are short and rounded. The profile to the commencement of the dorsal is very slightly arched, or almost straight, and the forehead is flattened transversely. A central ridge running from the occiput to between the nostrils is visible in the dry specimen; it is faintly feathered by minute streaks. The lateral ridges are short and indistinct. The thin, anterior crest of the orbit projects more suddenly and acutely than in the *Amphacanthus notostictus*, and it is more distinctly serrated. The cheek is entirely destitute of scales, and there are very few on the temples. The limbs of the preoperculum meet at a right angle; the upper one is shorter than in *notostictus*, and the more rounded and minutely serrated corner is consequently brought farther back, being placed under the posterior third of the orbit. The occiput may be said to be minutely granulated rather than furrowed, and the pits and streaks of the suborbitars and opercular bones are delicate and indistinct. The furrows are more evident on the humeral bones, but even there they are less deeply impressed than in *notostictus*.

The teeth of the upper jaw are notched with unequal points, the larger point being denticulated. In the lower jaw the points of the teeth are still more unequal, one being placed at the base of the other.

Rays:—B. 5; D. 13|10; A. 7|9; C. 17½; P. 15; V. 2|3.

If any peculiar patterns of colour are exhibited by the recent fish, they have entirely disappeared in the prepared specimen, the only colour remaining being an uniform dark reddish brown. The fins are colourless and spotless. In the absence of any peculiar markings I have relied on the nakedness of the cheek as a specific character, though I have not been hitherto able to verify its importance by an examination of other species. The fish selected by the authors of the 'Histoire des Poissons' as a type of the genus is described as having the cheek and temples covered by innumerable little scales, and nothing is said of any of the other *Amphacanthi* differing in this respect. We have seen that the *Amph. notostictus* has the anterior half of the cheek naked, and in the present species it is wholly so.

Dimensions.

	inches.	lines.
Length from upper lip to tip of caudal lobe	8	2
——————————— base of caudal fin	6	7½
——————————— anal	3	5

* *Amphacanthus punctatus*, Bl. Schn. p. 210; Cuv. et Val. x. p. 146.

Dimensions (*continued*).	inches.	lines.
Length from upper lip to anus	2	8½
——————————— ventrals	2	2
——————————— dorsal	1	9½
——————————— tip of gill-cover	1	7¼
——————————— centre of eye	1	0
Diameter of orbit	0	6
Length of caudal lobe	1	11
——— central caudal rays	1	0
Depth of caudal fork	0	9
Length of pectorals	1	3
——— ventrals	0	10
Height of eighth dorsal spine	0	9½
——— first and thirteenth ditto	0	5¾
——— anterior soft rays	0	8⅓
——— third anal spine	0	9
——— seventh and anterior soft rays	0	7½
——— body	2	5
——— trunk of tail	0	5
Length of trunk of tail	0	7½

Acanthurus grammoptilus (*Nob.*), The Lurgee.

No. 13. Mr. Gilbert's list.

This Acanthurus is named 'Lurgee' by the natives of Port Essington, and is very abundant in the bays near the head of the harbour. It appears to have a greater affinity with the *Ac. matoides* than with any other species described in the 'Histoire des Poissons;' but as *matoides* is said to have filiform tips to the ventrals and caudal as well as a pointed dorsal and anal, I am induced to keep them distinct, though I am unable to say how far it is correct to do so, having seen neither figure nor specimen of *matoides*. *Ac. nigro-fuscus* (Forsk.), which resembles the Port Essington fish in colour, has the profile slightly curved in the form of the Italian *f*. The Lurgee has the pale ring round the base of the caudal which exists in *Ac. Blochii*, and seems to agree with that species in some other characters; but the caudal spine, though it is not remarkably large, can scarcely be said to be little.

The profile is fully as convex as that of the *mata* of Russell (82), but the body is more elongated, being less high at the pectorals. The height of the body is equal to half the length of the oval, comprised between the tip of the snout and base of the caudal lancet. The dorsal is less high and more angular behind than that of the *mata*; but the anal and caudal are as represented in Russell's figure. When the latter fin is fully spread out in the Lurgee, the tapering falcate tips project about a fourth part beyond the straight intermediate edge; when only partially displayed, the edge of the membrane is lunate, and the upper tip of the caudal is just perceptibly longer than the under one. The tapering ventrals are acute, but their points are not filiform. Each jaw contains eighteen or nineteen teeth, the upper ones, and the central pair of under ones, being crenated on their sides and rounded tips; while the lateral ones of the lower jaw

are crenated on their obliquely truncated crowns only. The eye is more elevated than in the *mata*, and the descending limb of the preoperculum slopes much more forwards to meet the much shorter horizontal limb at an obtuse angle: the corner of the bone is slightly rounded, and its surface is marked by six or seven diverging lines. The opercular, scapular, and humeral (coracoid) bones are conspicuously furrowed, but no streaks or ridges are visible upon the suboperculum, very small interoperculum or cranium.

Rays:—D. 9|26; A. 3|24; C. 16½; P. 15; V. 1|5.

The first dorsal spine is small, and not easily detected except by dissection; it stands on the fore-part of a subglobular interspinous bone, and acts as a trigger to the second spine, which is articulated to the same bone, the mechanism bearing much resemblance to that of the dorsal spine of a *Monacanthus*. The other spines lengthen gradually as they approach the jointed rays, becoming at the same time more slender. The first anal is small, short, and so much enveloped by integument that it is very likely to be overlooked. The scales on the body are small and strongly ciliated; those on the head and breast are smoother and still smaller. The lateral line is parallel to the back until it assumes a straight course through the tail along the upper lip of the lancet sheath.

Colour of the dried specimen dark yellowish-brown, deepening to chestnut-brown on the head and about the gill-opening. The pectorals are pale, the other fins dusky brown, the anal and posterior part of the dorsal being deeper. There are five dark longitudinal streaks on the dorsal, and some lines more faintly traced on the border of the anal, both these fins being also very narrowly edged with black. An indistinct pale bar crosses the base of the caudal, and there are some very faint transverse lines on the distal end of the fin.

Dimensions.	inches.	lines.
Length from upper teeth to tips of caudal lobes	9	8
——— ends of central caudal rays	8	11
——— base of caudal lancet	7	0
——— beginning of anal	3	11
——— beginning of dorsal	2	7
——— ventral spine	2	7
——— gill-openings	2	0
——— pectorals	2	0
——— eye	1	7
Diameter of eye	0	5½
Height of body	3	3
——— first dorsal spine	0	4
——— eighth ditto	1	0
——— longest articulated rays of dorsal	1	1
——— third anal spine	0	10
——— soft rays	1	0
Length of central caudal rays	1	4
——— projection of upper falcate caudal tip	0	9
——— projection of lower ditto	0	6
Length of caudal lancet	0	7
——— pectorals	1	10
——— ventrals	1	5

ATHERINA HEPSETOIDES (*Nob.*), Tasmanian Sauclet.

Several examples of an Atherine, corresponding very closely in external form with the Mediterranean Sauclet, were sent to me from Port Arthur by Mr. Lempriere. Long maceration in spirits and friction against larger fish during the voyage home have destroyed the colours of the specimens, but their forms are tolerably perfect, and a sedulous comparison of the specimens with the figure and detailed description of the Sauclet in the 'Histoire des Poissons' elicited the very few tangible differences which are comprised in the following notice.

The body is rather more elevated than that of the Sauclet, its height forming only the eighth part of the total length; the nape is also a little narrower, but the roundish form of the body, the proportional length of the head, the comparative size of the eye, and its position removed its own breadth from the tip of the snout, the great protractility of the intermaxillaries, the minuteness of the teeth, the total recession of the maxillary beneath the edge of the triangular preorbitar when the jaws are closed, and the numbers and form of the dorsal rays, are all exactly as in the Sauclet; the first dorsal has likewise the same relative position above the middle of the ventrals as in that species, but it commences at a point nearer to the tip of the snout than to the base of the caudal, instead of exactly in the middle of the fish. Moreover, the anal fin contains two rays above the number ascribed to *hepsetus* in the 'Histoire des Poissons.' There are four oval cells on each side of the flat forehead and snout, with a lengthened triangular space between the rows, bisected by a slightly elevated, acute, mesial ridge.

The rays of the fins are dotted with black; the silvery lateral band, which retains its colour and form after the scales are removed, is similar in breadth and situation to that of *hepsetus*, and the back is ornamented with black specks ranged round the edges of the scales.

RAYS:—D. 9|—1|11; A. 1|14; C. 15/7; P. 15; V. 1|5.

The interior of the peritoneum and the ovarium are black. In the specimen examined the ova were numerous and large, occupying more than two-thirds of the cavity of the abdomen. The spine consists of 48 vertebræ, whose bodies have an exact hour-glass form. Several of the anterior spinous processes have dilated semi-membranous edges, which are gradually restricted as they recede from the cranium. At the 20th vertebra the lateral processes are bent downwards, and unite to form a canal for the passage of the vessels, and perhaps for the reception of the point of the air-bladder. At the twenty-fourth vertebra the change from lateral to inferior spinous processes is complete. There is a slight membranous expansion of the intermediate processes, but it is not very evident. In *A. presbyter* the transverse processes, from the 25th to the 30th vertebra, expand and unite below, to form a funnel, which encloses the end of the air-bladder. In *hepsetus* a less conspicuous dilatation of the processes of four vertebræ commences at the thirty-third.

Dimensions.	inches.	lines.
Length from tip of snout to point of caudal	4	2
——————— base of caudal	3	7
——————— second dorsal	2	5
——————— anal	2	4½
——————— anus	1	9
——————— first dorsal	1	7
——————— ventrals	1	5½
——————— edge of gill-cover	0	8½
Diameter of eye	0	2¾
Length of snout before eye	0	2½
Height of body	0	6
——— first dorsal	0	5¼
——— second ditto	0	4
Length of pectorals	0	7
——— caudal	0	7

ATHERINA PRESBYTEROIDES (*Nob.*), Tasmanian Roseret.

Three examples of an Atherine, strongly resembling the sandsmelt (*A. presbyter*) so common on the south coast of England in physiognomy and general proportions, were sent to me from Port Arthur by Mr. Lempriere.

The Tasmanian fish is however more elevated, owing to the greater protuberance of its belly; the length of its head and the height of its body are equal to each other, and also to a fifth of the total length of the fish, caudal included. The portion of the snout lying before the orbit is one-fourth of the entire length of the head, and the diameter of the eye is a little greater, being one-third of that length. The mesial ridge of the snout is not prolonged so far back as in *presbyter*, but rises rather higher, forming a short obtuse eminence between the nostrils. The inequalities of the cranium are more rounded than in the sandsmelt just named, and there are oblique pores leading to cells over the orbits, but no open oval pits as in *hepsetoides*. The intermaxillaries have as little protractility as those of *presbyter*; the teeth appear to be of the same size as in that species, and there is an equal correspondence in the depressions of the preorbitars and shapes of the opercular bones.

RAYS:—D. 9|—10 or 11; A. 1|12; C. 15¾; P. 11; V. 1|5.

The first dorsal is small in all its dimensions; its rays slender and flexible: it stands wholly anterior to the anus, commencing just perceptibly behind the ventrals. I could not satisfy myself whether the first ray of the second dorsal was spinous or jointed. The anal spine is short and very flexible. As the pectoral rays are fewer than in the other Atherines, they were repeatedly counted and found to correspond exactly in all the three specimens. All the rays of the ventrals are equally soft and flexible, and the jointed ones split so readily to the base when handled that they might easily be reckoned as exceeding the normal number. The scales are rather large, and there are only two rows of them above the silvery lateral band, while in *presbyter* there are three. The scale on the summit of the back, immediately before the spinous dorsal, embraces the first ray in a narrow notch.

The specimens having been sent home in brine containing much undissolved salt, have suffered injury from the friction, and the original tints of colour cannot be made out, but they appear to have been much darker on the upper parts than the English Atherine. The *A. pectoralis* and *endrachtensis*, which are New Holland species of the same subdivision of the genus with *presbyteroides* and the *lacunosa* of Forster, which frequents the coasts of New Caledonia and New Guinea, and may be expected to be found on the northern shores of Australia, have only five or six rays in the first dorsal, and also differences in the other fins, that readily distinguish them from the Tasmanian Roseret, which moreover shows no traces of the black tip to the pectoral, so characteristic of *pectoralis*. The vertebræ are forty-six in number, and have the same hour-glass form with those of *hepsetoides*.

Dimensions.	inches.	lines.
Length from tip of snout to points of caudal	3	7
——————————— base of ditto	3	1
——————————— anus	1	8
——————————— first dorsal	1	5
——————————— ventrals	1	4¾
——————————— edge of gill-cover	0	8
——————————— eye	0	2
Diameter of the eye	0	3
Length of pectorals	0	6
Height of body	0	8
Width of occiput	0	3½

Atherina nigrans (*Nob.*), The Yalgurnda.

No. 9. Mr. Gilbert's list.

Mr. Gilbert informs us that this little fish is a tolerably abundant inhabitant of the freshwater streams that flow into the harbour of Port Essington, and that it is very easily taken with a hook baited with flies or fresh meat. Yalgurnda is its native name. It is a member of that group of Atherines which is characterized by the peculiar angular form of the mouth. Five American examples of the group, and one from New Holland, the *A. Jacksoniana*, are described in the 'Histoire des Poissons.' The Yalgurnda inhabiting the opposite extremity of the Australian continent to *Jacksoniana* is readily distinguished from it by its higher form, fewer rays in the first dorsal, and black lateral band, instead of a bright silvery and green one.

The profile of the Yalgurnda is a pretty regular ellipse, which is terminated anteriorly by the thin jaws, and posteriorly by the trunk of the tail, whose height is about one-tenth of the total length of the fish, while the greatest altitude of the body is one-fourth of that length. The dorsal and anal curves are similar, and the first dorsal fin commences on the summit of the arch of the back, and a little posterior to the anal spine. The first ray of both dorsals, of the anal and of the ventrals, is moderately strong with a pungent tip,

differing in this respect from the same rays in most Atherines, which have them equally slender and flexible with the other rays. *Ath. Humboldtiana* alone, of the species figured in the 'Histoire des Poissons,' seems to have the anterior ray of these fins stiff and pungent. The four posterior rays of the first dorsal are very slender and flexible, and the two nearest to the spine have filamentous tips overtopping it by half their height. The spine of the second dorsal is slightly curved, and but little shorter than the jointed ray which immediately succeeds it. The fin rises somewhat as it runs backwards, and ends in an acute point, which reaches to the base of the caudal. The anal is very similar to the second dorsal and is equally pointed, but its spine is scarcely so long. The naked trunk of the tail, bounded by the three vertical fins, forms more than a seventh part of the entire length of the fish. The ventrals are attached before the middle of the pectorals, and their soft rays end in a thread-like tip, which overlaps the commencement of the anal. The pectoral is acute, its fourth and fifth rays being the longest: the lower ones are short, giving a rounded form to that part of the fin. The caudal is forked.

Rays:—D. 1|4—1|12; A. 1|18; C. 17$\frac{4}{4}$; P. 13; V. 1|5.

The head forms a fifth part of the length of the fish; the snout is flat, and the intermaxillaries are horizontal near the symphysis, but their limbs bend at a right angle: the lower jaw has a similar but less acute flexure. The teeth, moderately strong, stiff, and sufficiently visible to the naked eye, form a narrow villiform stripe on each jaw. The edges of the vomer and palate-bones are rough to the touch, but a common eye-glass is insufficient to show their teeth. The diameter of the small eye is just equal to the portion of the snout which lies before it. The preoperculum forms an acute angle, as in the Mullets, and there are three rows of scales on the triangular cheek enclosed by its limbs, a larger scale covering the corner of the bone. The scales of the body are large, there being only thirty on the lateral line, exclusive of several small ones on the base of the caudal. A vertical row on the most elevated part of the side contains ten scales, of which four are above the lateral line and five below it. The disposition of the scales is in very regular longitudinal rows, the exposed disc of each forming a vertical ellipse acute at both ends, and approaching to a hexagon. The lateral line is marked by a pore in the disc of each of its scales, which are similar in size and form to the others on the body. An even black stripe, coincident with the scales of the lateral line, terminates at the base of the caudal, and is continued forwards over the gill-cover, upper half of the eye, and sides of the snout. This black stripe replaces the usual silvery lateral band, of which there is no other vestige. All the scales above it have narrow black borders, which produce rows of meshes. The scales below the band are destitute of dark markings. There are some blackish tints on the fins, most evident on the dorsals.

Dimensions.	inches.	lines.
Length from upper teeth to tip of caudal fin	3	2
——————————— base of caudal	2	8

Dimensions (*continued*).	inches.	lines.
Length from upper teeth to beginning of second dorsal	1	8
——— first ditto	1	4
——— anal	1	3
——— ventrals	1	11½
——— pectorals	0	8
——— edge of gill-cover	0	7¾
Diameter of the eye	0	2
Length of snout before the eye	0	2
Height of body	0	9
Length of naked part of tail	0	4½

[To be continued.]

XXIX.—*On the Structure and Functions of the Pollen Granules.* By William Wilson, Esq.

In the 'London Journal of Botany' for November 1842, the results of a sedulous inquiry into the true structure and functions of the pollen-collectors of *Campanula* were presented to its readers; and in the following month a letter from Arthur Hill Hassall, Esq. appeared in the same Journal, directing my attention to his own remarks on the same topic, published in the 'Annals and Magazine of Natural History' for October last.

In acknowledging Mr. Hassall's courtesy, I beg to say that I had not seen his paper, or it would have been discussed when mine was written.

Mr. Hassall has misunderstood me. I endeavoured to state that the pollen granules are taken bodily into the interior of the collecting hairs, and are ultimately lodged in the imbedded cavities; but Mr. Hassall supposes that I allude only to the pollen tubes. Having met with only one instance of tubes from a pollen granule thus imbedded, I did not insist upon it as a fact, but reserved that point for future inquiry.

I must entirely dissent from Mr. Hassall's views. In the first place, I cannot admit the propriety of terming that part where the collecting hairs are found, a "stigma." He says that the papillæ of the stigmatic branches "resemble the hairs in everything save length;" but if the views of physiologists are right, as I believe them to be, there must be an essential difference between these *papillæ* (rounded sides of vesicles of cellular stigmatic tissue, according to Lindley,) and the *collecting hairs*, concerning the anatomy of which Mr. Hassall considers Brongniart to have given a satisfactory account; for the hairs are regarded by the latter as an extension of the cuticle covering the whole surface of the style.

In the second place, I deem it premature and hazardous,